

MSE 480/580 - Experimental Methods for Microstructural Analysis

2012-2013 catalog description: An introduction, through a combination of lectures and laboratory experiences, to both established and new techniques for microstructural characterization of materials. [3 units, offered in the Spring]

Textbook: *Optional.* ASM Handbook: Vol. 10: Materials Characterization.

Learning Objectives:

- Understand principles of various materials characterization techniques
- Compare advantages and disadvantages of each technique to the relevant ones
- Identify the most suitable technique to provide the information you need for your samples
- Recognize practical consideration and limitations of each technique
- Improve your technical communication skills and team work skills

Class Format: The course is designed to involve students in the cooperative learning/teaching mode. Class will be divided into groups of five students. There will be several group activities. The grading will be based on individual, group performance and peer evaluation. We will visit laboratories of various characterization techniques on most of the Friday sessions.

A list of contacts is given below for your acquisition of detailed information.

1. FTIR, Fourier Transform IR Spectroscopy	Prof. P. Lucas, AML W113	322-2311
2. Raman Spectroscopy	Steven Hernandez, USIF	621-5097
3. XPS, X-ray Photoelectron Spectroscopy	Dr. Ken Nebesny	621-6334
4. XRD, X-ray Diffraction	Phil Anderson, USIF	307-1864
5. EPM, Electron Probe Microanalysis	Dr. Ken. Domanik	621-2959
6. SEM, Scanning Electron Microscopy	Steven Hernandez	621-5097
7. AES, Auger Electron Spectroscopy	Dr. Ken Nebesny	621-6334
8. TEM, Transmission Electron Microscopy	Phil Anderson, USIF	307-1864